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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/774,168 | 02/06/2004 | Jose P. Pereira | P249-1WLP | 7294 |

25670 7590 03/06/2006

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EXAMINER

KO, DANIEL BOKMIN

ART UNIT PAPER NUMBER

2189

DATE MAILED: 03/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|--------------------------------------|---|--|
| Office Action Summary | Application No. 10/774,168 | Applicant(s) PEREIRA, JOSE P. | |
| | Examiner Daniel B. Ko | Art Unit 2189 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 February 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This action is responsive to the application filed on 2/6/2004. Claims 1-30 have been submitted for examination.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1-4, 6-9, 11-13, 16-17, 19-20, and 22-30 are rejected under 35 U.S.C. 102(b) as being anticipated by Pereira (US Patent 6,324,087 B1).

Pereira teaches as claimed including “Each block select circuit compares the search code with its class code and, in response thereto, selectively enables or disables the corresponding CAM block” (See abstract).

Regarding claims 1, 12, 24, and 29, Pereira teaches a content addressable memory (CAM) device for comparing a search key to data values stored therein, comprising:

a plurality of CAM blocks, each including an array of CAM cells to store a predetermined range of data values (Fig. 9, CAM Blocks 802(0-3); column 12, lines 9-44; Pereira shows the table 1 with CAM 802(0) contains 0 to k-1 range of address, CAM 802(1) contains k to 2k-1 range of address and etc.);

means for extracting a selected portion of the search key in response to a select signal (column 10, lines 18-31; Pereira teaches extracting A[13:12] from 14 bit address A[13:0] to selects one of the CAM blocks); and

means for selectively enabling each CAM block in response to a comparison between the selected portion of the search key and the predetermined range of data values for the corresponding CAM block (column 1, lines 64-67; column 2, lines 1-17).

Regarding claim 2, Pereira teaches a CAM device, wherein the means for extracting comprises a parsing circuit (column 10, lines 18-31; Pereira teaches extracting A[13:12] from 14 bit address A[13:0] to selects one of the CAM blocks).

Regarding claims 3 and 19, Pereira teaches a CAM device, wherein the data values comprise network addresses (column 4, lines 58-67; column 5, lines 1-10).

Regarding claims 4 and 20, Pereira teaches a CAM device, wherein each CAM block is assigned to store a unique range of data values (Fig. 9, CAM Blocks 802(0-3); column 12, lines 9-44; Pereira shows the table 1 with CAM 802(0) contains 0 to k-1 range of address, CAM 802(1) contains k to 2k-1 range of address and etc.).

Regarding claims 6 and 22, Pereira teaches a CAM device, wherein the selected portion of the search key comprises a number of most significant bits of the search key

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(column 10, lines 18-31; Pereira teaches selecting a portion of the search key A[13:12] from 14 bit address A[13:0] to selects one of the CAM blocks).

Regarding claims 7 and 23, Pereira teaches a CAM device, wherein each data value has an associated priority value (column 3, lines 33-57).

Regarding claims 8-9, 13, 16, 25-27 and 30, Pereira teaches a CAM, wherein the means for selecting enabling comprises a plurality of block select circuits (Fig 7, Select 706(1-n)), each configured to enable a corresponding CAM block (column 1, lines 64-67; column 2, lines 1-17) if the selected portion of the search key falls within the predetermined range of data values stored in the corresponding CAM block (column 12, lines 2-44).

Regarding claim 11, Pereira teaches a CAM device, wherein each block select circuit disables the corresponding CAM block (column 1, lines 64-67; column 2, lines 1-17) if the selected portion of the search key does not fall within the predetermined range of data values stored in the corresponding CAM block (column 12, lines 2-44).

Regarding claims 17 and 28, Pereira teaches a CAM device, wherein the function generator performs a logical function on the selected portion of the search key (column 16, lines 24-39).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
 2. Ascertaining the differences between the prior art and the claims at issue.
 3. Resolving the level of ordinary skill in the pertinent art.
 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
2. Claims 5, 14-15, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pereira (US Patent 6,324,087 B1), in view of Stark (US Patent 6,633,953 B2).

Regarding claims 5, 14-15, and 21, Pereira teaches a content addressable memory (CAM) device for comparing a search key to data values stored therein, comprising:

a plurality of CAM blocks, each including an array of CAM cells to store a predetermined range of data values (Fig. 9, CAM Blocks 802(0-3); column 12, lines 9-

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means for extracting a selected portion of the search key in response to a select signal (column 10, lines 18-31; Pereira teaches extracting A[13:12] from 14 bit address A[13:0] to select one of the CAM blocks); and

means for selectively enabling each CAM block in response to a comparison between the selected portion of the search key and the predetermined range of data values for the corresponding CAM block (column 1, lines 64-67; column 2, lines 1-17).

Pereira fails to teach CAM blocks that are assigned to store overlapping ranges of data values. Stark teaches one or more CAM blocks that are assigned to store overlapping ranges of data values (column 2, lines 13-17; column 3, lines 15-19).

At the time of invention it would have been obvious to a person of ordinary skill in the art to combine the Pereira with Stark. The motivation for doing so would have been low power consumption and a high search performance (column 3, lines 11-14).

Regarding claim 14, Pereira combined with Stark teach a CAM device, wherein the compare circuit asserts the block select signal if the selected portion of the search key is greater than the lower range value and less than the upper range value for the corresponding CAM block (See Stark, column 3, lines 15-19; column 4, lines 8-23; column 5, lines 53-58).

Regarding claim 15, Pereira combined with Star teach a CAM device, wherein the compare circuit de-asserts the block select signal if the selected portion of the search key is less than the lower range value or greater than the upper range value for the corresponding CAM block (See Stark, column 5, lines 26-44).

3. Claims 10 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pereira (US Patent 6,324,087 B1), in view of King (US Patent 7,003,625 B2).

Regarding claims 10 and 18, Pereira teaches a content addressable memory (CAM) device for comparing a search key to data values stored therein, comprising:

a plurality of CAM blocks, each including an array of CAM cells to store a predetermined range of data values (Fig. 9, CAM Blocks 802(0-3); column 12, lines 9-44; Pereira shows the table 1 with CAM 802(0) contains 0 to k-1 range of address, CAM 802(1) contains k to 2k-1 range of address and etc.);

means for extracting a selected portion of the search key in response to a select signal (column 10, lines 18-31; Pereira teaches extracting A[13:12] from 14 bit address A[13:0] to selects one of the CAM blocks); and

means for selectively enabling each CAM block in response to a comparison between the selected portion of the search key and the predetermined range of data values for the corresponding CAM block (column 1, lines 64-67; column 2, lines 1-17).

Pereira fails to teach the function generator that performing a hash function on the selected portion of the search key. King teaches the function generator that performing a hash function on the selected portion of the search key (column 2, lines 45-58).

At the time of invention it would have been obvious to a person of ordinary skill in the art to combine the Pereira with King. The motivation for doing so would have been an even distribution of entities across the plurality of columns in the CAM using the hash function (column 2, lines 45-58; column 9, lines 12-16).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel B. Ko whose telephone number is 571-272-8194.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Reginald Bragdon can be reached on 571-272-4204. The fax phone number for the organization where this application or proceeding is assigned is 703-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Daniel Ko

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Reginald G. Bragdon
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